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EXAMINER	
STEVENS, THOMAS H	

ART UNIT	PAPER NUMBER
2123	

DATE MAILED: 10/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/641,591	ROSEDALE, PHILIP	
	Examiner	Art Unit	
	Thomas H. Stevens	2123	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-54* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-54* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *18 August 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-54 were examined.

Response to Applicant's Remarks

Information Disclosure Statement

2. The applicants are thanked for addressing this issue. The examiner acknowledges the cited art in question. However ,the reference by Omega Engineering lacks a publication date. Objection stands.

35 USC § 112 (1st)

3. The applicants are thanked for addressing this issue. However, the rejection stands because the examiner firmly believes descriptions and purpose of signal generators and passive feedback networks/functions are significant integral tools of the invention worth detailing (i.e., claims 11 and 26).

35 USC § 112 (2nd)

4. The applicants are thanked for addressing this issue. The examiner is unclear in what context the words "substantially" and "adapted" is used within the body of the claims (i.e., claims 4,11,30,35 and 43). Rejection stands. However, the examiner acknowledges the change to claim 43; rejection is withdrawn.

35 USC § 102 & 103

5. The applicants are thanked for addressing this issue. The examiner recognizes applicants based on U.S. Patent 6,005,548 Latypov et al. as persuasive, thus claims directed to 35 U.S.C. 102 and 103 rejections, by Latypov et al., are withdrawn.

6. The examiner recognizes the change to independent claim 15, for example, stating "user's body is substantially immobilized" in order to negate the rejection by Tremblay. However, the examiner deems the change unpersuasive because the phrase merely states a vague and indefinite opinion, which doesn't enhance or modify the physical characteristics of the invention. Thus rejections to claims 15-22 and 52-54 by Tremblay et al stand.

7. Furthermore, new grounds of rejection are disclosed in the following section.

Objection

Specification

8. The amendment filed on 8/2/04 is objected to under 35 U.S.C. 132 because it introduces new matter into the disclosure. 35 U.S.C. 132 states that no amendment shall introduce new matter into the disclosure of the invention. The added material, which is not supported by the original disclosure, is as follows:

In a similar way, the use of haptic, or "passive," feedback can be used to provide a sense of body motion to the user, even when the user is being held immobile.

Although it is contemplated that such feedback may be used for any and all appropriate muscles, including those that cause movement of the head, this haptic feedback can be particularly advantageous when used with limb immobilization. This is because unlike head immobilization, in which visual feedback will always provide some sense of what is happening, the user may not always be looking at their hands, arms, or feet. Because of this, they may not realize that they have relaxed, possibly allowing their sword to drop to their side in the simulated environment instead of being held ready.

Applicant is required to cancel the new matter in the reply to this Office Action.

Rejections

Claim Rejections - 35 USC § 112

9. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

10. Regarding claims 23-41, the word "system" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

11. Regarding claims 15, 23, 30 and 45, the word "substantially" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

Claim Rejections - 35 USC § 102

12. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

13. Claims 6-14 are rejected under 35 U.S.C. 102(e) as being anticipated by Watanabe et al. (U.S. Patent 6,271,760 (1999)). Watanabe et al. teaches a human body detector for a seat does not deteriorate comfort of sitting even when it is disposed on the seat, has a high sensitivity and can be easily fitted to the seat (abstract).

Claim 6: A method for providing feedback to a user of a processing unit (column 6, lines 7-20), comprising the steps of: providing an immobilizing device which holds a portion of the user's body immobile (abstract: (i.e., seat)); providing vibrating devices disposed upon the immobilizing device and positioned to touch the immobilized portion of the user's body near muscles which would extend if the immobilized portion of the user's body moved (column 22, lines 26-35 with column 21, lines 24-39); sending signals from the processing unit to the vibrating devices to cause the vibrating devices to vibrate (column 21, lines 24-39); controlling these signals such that the vibrating devices located near a particular

muscle vibrate to provide feedback indicating that the immobilized portion of the user's body is moving (column 21, lines 9-54).

Claim 7: A method as in Claim 6 (column 6, lines 7-20; column 22, lines 26-35 with column 21, lines 24-39) wherein the signals sent to the vibrating devices by the processing unit are controlled based upon the forces exerted by the immobilized portion of the user's body against the immobilizing device (column 29, lines 20-25).

Claim 8: A method as in Claim 7(column 6, lines 7-20; column 22, lines 26-35 with column 21, lines 24-39; column 29, lines 20-25) wherein the forces exerted against the immobilizing device are measured using strain gauges (column 16, lines 45-50) disposed upon the immobilizing device.

Claim 9: A method as in Claim 7(column 6, lines 7-20; column 22, lines 26-35 with column 21, lines 24-39; column 29, lines 20-25) wherein the signals are sent to the vibrating devices such that the feedback provided indicates to the user that the immobilized portion of the user's body is moving in the way it would have moved were it not immobilized (column 16, lines 10-21).

Claim 10: An input system for a user comprising an immobilizing device which restricts the motion of a portion of the user's body (column 30, lines 17-22) a vibrating device disposed substantially adjacent to a nerve spindle of a muscle of the user's body which extends when the restricted portion of the user's body moves, and a processing unit which sends signals to the vibrating devices to control the operation of the vibrating devices, the processing unit controlling the signals such that the vibrating devices located adjacent to a particular muscle provide feedback indicating that the restricted portion of the user's body is moving (column 29, lines 11-32).

Claim 11: An input system as in Claim 10 (column 30, lines 17-22; column 29, lines 11-32) wherein the vibrating device comprises a signal generator (column 29, lines 37-40) adapted for connection to a body at a location such that it will affect the signal sent by the nerve spindle to the brain.

Claim 12: An input system as Claim 10 (column 30, lines 17-22; column 29, lines 11-32; column 29, lines 37-40) wherein the signals sent to the vibrating devices by the processing unit are controlled based upon the forces exerted by the immobilized portion of the user's body against the immobilizing device (column 29, lines 11-25).

Claim 13: An input system as in Claim 12 (column 30, lines 17-22; column 29, lines 11-32; column 29, lines 37-40) wherein the forces exerted against the

immobilizing device are measured using strain (column 16, lines 45-50) gauges disposed upon the immobilizing device.

Claim 14: An input system as in Claim 10 (column 30, lines 17-22; column 29, lines 11-32) wherein the signals are sent to the vibrating devices such that the feedback provided indicates to the user that the immobilized portion of the user's body is moving in the way it would have moved were it not immobilized (column 16, lines 10-21).

14. Claims 15-22, 52-54 are rejected under 35 U.S.C. 102(e) as being anticipated by Tremblay et al. (U.S. Patent 6,275,213 (1998)).

Tremblay teaches a man-machine interface, which provides tactile feedback to various sensing body parts, is disclosed. The device employs one or more vibrotactile units, where each unit comprises a mass and a mass-moving actuator. As the mass is accelerated by the mass-moving actuator, the entire vibrotactile unit vibrates. Thus, the vibrotactile unit transmits a vibratory stimulus to the sensing body part to which it is affixed. The vibrotactile unit may be used in conjunction with a spatial placement-sensing device, which measures the spatial placement of a measured body part. A computing device uses the spatial placement of the measured body part to determine the desired vibratory stimulus to be provided by the vibrotactile unit. In this manner, the computing device may control the level of vibratory feedback perceived by the

corresponding sensing body part in response to the motion of the measured body part. The sensing body part and the measured body part may be separate or the same body part (abstract).

Claim 15: A method for providing, an indication to a user that his body has moved when it has not, comprising: detecting the intended motion of a portion of the user's body; providing sensory feedback, which is a reflection of the intended motion (column 17, lines 34-67; and column 18, lines 1-25).

Claim 16: A method as in Claim 15 (column 17, lines 34-67; and column 18, lines 1-25 with figure 23) further comprising the step of immobilizing the portion of the user's body.

Claim 17: A method as in Claim 15 (column 17, lines 34-67; and column 18, lines 1-25 with figure 23) wherein the sensory feedback comprises a vibration produced by a vibrating element placed against the user's body (column 15, lines 1-12).

Claim 18: A method as in Claim 17 (column 17, lines 34-67; and column 18, lines 1-25 with figure 23) wherein the sensory feedback provided suspends the feedback provided naturally by the user's body, which reflects the actual motion of the portion of the user's body (column 15, lines 13-22).

Claim 19: A method as in Claim 16(column 17, lines 34-67; and column 18, lines 1-25 with figure 23) wherein the step of immobilizing a portion of the user's body further comprises attaching the portion of the user's body to a rigid structure so as to restrict the motion of the portion of the user's body (column 11, lines 38-47).

Claim 20: A method as in Claim 19 (column 17, lines 34-67; and column 18, lines 1-25 with figure 23) wherein the step of detecting the intended motion comprises measuring the force (column 12, lines 62-65) applied against the rigid structure by the immobilized portion of the user's body.

Claim 21: A method as in Claim 20 (column 17, lines 34-67; and column 18, lines 1-25 with figure 23) wherein the force applied against the rigid structure is measured by using strain gauges to detect the deflection of the structure due to the force applied against it (column 13, lines 1-5).

Claim 22: A method as in Claim 15(column 17, lines 34-67; and column 18, lines 1-25 with figure 23) wherein the step of detecting the intended motion comprises measuring the direction and magnitude of the forces applied by the immobilized portion of the user's body (column 15, lines 50-54).

Claim 52: A method for a user to control an environment simulated on a computer system where the user is modeled within the simulated environment, comprising (column 17, lines 34-67; and column 18, lines 1-25): providing at least one immobilizing device which restricts the motion of at least a portion of the user's body; detecting the forces exerted by the immobilized portion of the user's body against the immobilizing device; sending a signal representing these forces (column 4, lines 10-16) to the computer system; and determining the effect that these forces have upon the model of the user in the environment simulated by the computer.

Claim 53: A method as in Claim 52 wherein forces exerted by the immobilized portion of the user's body (column 4, lines 20-27) are detected by measuring the deflection of the immobilizing device.

Claim 54: A method as in Claim 53 wherein the deflection of the immobilizing device is measured using strain gauges (column 13, lines 1-4) disposed upon the immobilizing device.

Claim Rejections - 35 USC § 103

15. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.

2. Ascertaining the differences between the prior art and the claims at issue.

3. Resolving the level of ordinary skill in the pertinent art.

4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claims 1-5 are rejected under 35 U.S.C. 103 (a) as unpatentable over Marci et al. (U.S. Patent 6,183,259 (1998)) in view of Watanabe et al. (U.S. Patent 6,271,760 (1999)).

Marci et al. teaches the simulation of physical movements with, subsequently, the use of a joystick and other input devices (column 7, lines 26) in which the user has control of images (abstract). However, the invention doesn't teach human simulation via motion sensors. Watanabe et al. teaches a human body detector for a seat does not deteriorate comfort of sitting even when it is disposed on the seat, has a high sensitivity and can be easily fitted to the seat (abstract).

It would have been obvious at the time of invention to one of ordinary skill in the art to modify the teachings of Marci et al. in view of Watanabe et al. since it would be advantageous to inject the individual's body images for simulation of an physical event for simulation and immediate feedback in real-time.

Claim 1: An input system for use, with a simulated environment (Macri: title), comprising: an immobilizing device, which restricts the motion of a portion of a user's body (Watanabe: column 29, lines 11-25); sensors, which detect forces applied by the restricted portion of the user's body (Watanabe: column 16, lines 5-22); a sensory feedback device, which provides a sensation to the user corresponding to the motion, which occurs in the simulated environment (Watanabe: column 16, lines 5-22).

Claim 2: An input system as in Claim 1 (Macri: title; Watanabe: column 29, lines 11-25) wherein the forces detected by the sensors are sent to the processing unit (Macri: column 7, lines 56-67) to determine the motion of the user in the simulated environment to which the sensations provided by the sensory feedback device will correspond (Watanabe: column 29, lines 11-44).

Claim 3: An input system as in Claim 1 (Macri: title; Watanabe: column 29, lines 11-25) wherein the sensors comprise strain gauges, (Watanabe: column 16, lines 45-50) which are disposed upon the immobilizing device

Claim 4: An input system as in Claim 1(Macri: title; Watanabe: column 29, lines 11-25) wherein the sensory feedback device comprises at least one vibrating element, (Watanabe: figure 3, (5') with column 15, lines 8-34) which is disposed substantially adjacent to a nerve spindle of a muscle of the restricted portion of the user's body

Claim 5: An input device as in Claim 1 (Macri: title; Watanabe: column 29, lines 11-25) wherein the sensory feedback device is used to provide a sensation of movement to the user when no actual movement of the type corresponding to the sensation occurs (Watanabe: column 16, lines 5-22).

18. Claims 23-34 and 39-44 are rejected under 35 U.S.C. 103 (a) as unpatentable over Marci et al. (U.S. Patent 6,183,259 (1998)) in view of Watanabe et al. (U.S. Patent 6,271,760 (1999)) and in further view of Maguire, Jr. (U.S. Patent 5,734,421 (1998)).

Marci et al. teaches the simulation of physical movements with, subsequently, the use of a joystick and other input devices (column 7, lines 26) in which the user has control of images (abstract). However, the invention doesn't teach human simulation via motion sensors with a helmet. Watanabe et al. teaches a human body detector for a seat does not deteriorate comfort of sitting even when it is disposed on the seat, has a high sensitivity and can be easily fitted to the seat (abstract); while Maguire teaches head movements for virtual reality.

It would have been obvious at the time of invention to one of ordinary skill in the art to use Watanabe et al. and Maguire to modify Marci et al. since it would be advantageous to inject the individual's body images for simulation of an physical event for simulation and immediate feedback in real-time.

Claim 23: An input system for use with a simulator (Maguire: column 2, lines 15-50), comprising an immobilizing device (Watanabe: column 14, lines 8-11), a processing

unit, and an output system (Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively), the immobilizing device (Watanabe: column 14, lines 8-11) holding the head of a user (Maguire: figure 1 with column 3, lines 51-60) in a substantially fixed position with respect to the user's torso and further comprising sensors to detect a force exerted by the user in attempting to move the user's head (Maguire: column 2, lines 29-39), and the processing unit calculating the effect of the force applied by the user in a simulated environment and presenting this effect in the simulated environment to the user via the output system (Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively).

Claim 24: An input system as in Claim 23 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the output system corresponds to a remotely operated physical device: which is operated according to the input system and which is controlled through the processing unit and represented in the simulated environment (Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively).

Claim 25: An input system as in Claim 23 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) further comprising vibration devices, the vibration devices touching the user within the immobilizing device

(Watanabe: column 16, lines 5-16) and being controlled by the processing unit to provide sensations for the user which mimic the sensations which would be felt during motion of the immobilized portion of the user's body as it moves in the simulated environment (Macri: column 2 ,lines 8-19, columns 7-8, lines 57-67 and 1-8; Watanabe: abstract; Kramer: abstract).

Claim 26: An input system as in Claim 23 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the processing unit is programmed to use a physical model for the simulated environment (Marci: column 4, lines 39-63), which provides passive feedback by immobilizing the user such that the user applies force against the immobilizing device in a manner, which reflects the forces, which would be applied to the user in the simulated environment (Watanabe: column 29, lines 12-47).

Claim 27. An input system as in Claim 23 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the immobilizing input device (Watanabe: column 14, lines 8-11) comprises a securement device within which the user places his head (Maguire: figure 1 with column 3, lines 51-60) and which is rigidly attached to a seat upon which the user sits during use of the input system.

Claim 28: An input system as in Claim 27 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the securement device comprises a helmet (Maguire: figure 1 with column 3, lines 51-60).

Claim 29: An input system as in Claim 27 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the securement device comprises a stiff headband.

Claim 30: An input system as in Claim 27 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the securement device comprises a pair of substantially semi-circular braces, one of which is placed upon the rear of the user's head and the other of which is fit snugly to the front of the user's head above the eyes and about the temples (Note: the examiner interprets the helmet feature superceding the semi-circular brace; while stating inherency to "fit snugly to front of user's head").

Claim 31: An input system as in Claim 27 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the securement

device is attached to the seat of the system using at least one support member (Maguire: figure 6A (108) with column 12, lines 35-46).

Claim 32: An input system as in Claim 31(Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the sensors are disposed upon the support member (Maguire: figure 6A (108) with column 12, lines 35-46).

Claim 33: An input system as in Claim 23 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the sensors comprise strain gauges (Watanabe: column 16, lines 47-50).

Claim 34: An input system as in Claim 33 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the sensors are disposed in two sets of opposing pairs on each support member (Maguire: figure 6A (108) with column 12, lines 35-46).

Claim 39: An input system as in Claim 23 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire:

column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the visual display of the output system fills substantially all of the visual field of view of the user (Maguire: column 5, lines 27-50) when the user's head is immobilized within the input system.

Claim 40: An input system as in Claim 39 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the visual display comprises a screen which is positioned between the user's head and a projection system located on the opposite side of the screen as the user's head (Maguire: column 2, lines 14-29).

Claim 41: An input system as in Claim 23 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein additional input signals are sent to the processing unit by an additional input device disposed (Macri: column 7, lines 24-25) upon the immobilizing device.

Claim 42: An input system as in Claim 41(Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the additional input device comprises a gun handle (Macri: column 7, lines 24-25) and trigger.

Claim 43: An input system as in Claim 41(Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the additional input device comprises one or more buttons (Macri: column 7, lines 24-25).

Claim 44: An input system as in Claim 41(Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the additional input device comprises a joystick (Macri: column 7, lines 24-25).

19. Claims 35-38, 45-51 are rejected under 35 U.S.C. 103 (a) as unpatentable over Marci et al. (U.S. Patent 6,183,259 (1998)) in view of Watanabe et al. (U.S. Patent 6,271,760 (1999)) and in further view of Maguire, Jr. (U.S. Patent 5,734,421 (1998)) with Kramer et al. (U.S. Patent 6,042,555 (2000)).

Marci et al. teaches the simulation of physical movements with, subsequently, the use of a joystick and other input devices (column 7, lines 26) in which the user has control of images (abstract). However, the invention doesn't teach human simulation via motion sensors with a helmet. Watanabe et al. teaches a human body detector for a seat does not deteriorate comfort of sitting even when it is disposed on the seat, has a high sensitivity and can be easily fitted to the seat (abstract); while Maguire teaches head movements for virtual reality with Kramer et al. teaching man-made interface by way of sensing body parts (abstract).

It would have been obvious at the time of invention to one of ordinary skill in the art to use Watanabe et al., Kramer et al. and Maguire to modify Marci et al. since it would be advantageous to inject the individual's body images for simulation of an physical event for simulation and immediate feedback in real-time.

Claim 35: An input system as in Claim 23 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) further comprising at least one additional immobilizing device which holds an arm of the user from the elbow to the hand in a substantially fixed position with respect to the torso of the user and which further comprises sensors disposed so as to measure the forces exerted by the arm of the user at least at a point near the elbow of the user and at a point near the wrist of the user (Watanabe: column 21, lines 24-39 with Marci : figure 25 and Kramer: column 8, lines 45-59).

Claim 36: An input system as in Claim 35 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the additional immobilizing device detects the forces exerted by the user in attempting to move his arm and sends this information to the processing unit (Kramer: column 8, lines 45-59).

Claim 37: An input system as in Claim 23 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) further comprising at least one additional immobilizing device (Kramer: column 7, lines 34-35) which holds a leg of the user from the knee to the foot in a substantially fixed position with respect to his torso and which further comprises pressure sensors disposed so as to measure the forces exerted by the leg of the user at least at a point near the knee of the user and at a point near the ankle of the user (Kramer: column 8, lines 45-59).

Claim 38: An input system as in Claim 37 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the additional immobilizing device (Kramer: column 7, lines 34-35) detects the forces exerted by the user in attempting to move his leg (Kramer: column 8, lines 45-59) and sends this information to the processing unit (Marci: figure 1, 202).

Claim 45: An input system for use with a computer, comprising at least one immobilizing device which holds a portion of the body of a user of the system in a substantially fixed position (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11), the immobilizing device comprising sensors and vibration devices, the sensors (Kramer: column 8, lines 45-59) being configured to

detect forces exerted by the user in attempting to move the portion of the body held by the immobilizing device, the sensors sending signals representing the magnitude and direction of these forces to the computer , and the vibration devices disposed upon the muscles of the user and controlled by the computer so as to provide sensations which mimic the sensations which would be felt if the attempted motion had occurred.

Claim 46: An input system as in Claim 45 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) further comprising a movable frame which is connected to the computer and actuators which are capable of moving the frame, wherein the user and the immobilizing device are located within the frame, and the actuators are controlled by the computer (Maguire: column 2, lines 5-11) so as to coordinate the motion of the frame to provide motion feedback to the user of the system (Kramer: column 8, lines 45-59).

Claim 47: An input system as in Claim 45 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the head of the user is immobilized with respect to the torso (Kramer: column 8, lines 45-59) of the user by the immobilizing device and further comprising a visual display disposed in fixed relation to the user's head, the display connected to the computer and configured to provide visual feedback to the user of the system (Maguire: column 2, lines 5-11).

Claim 48: An input system as in Claim 47 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the visual feedback provided encourages the user to apply forces to the immobilizing device in order to control the visual display (Watanabe: column 16, lines 5-16).

Claim 49: An input system as in Claim 45 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the input system is used to control a physical device, which is connected to the computer (Marci: column 2, lines 8-19; column 7, lines 55-67 with column 8, lines 1-8).

Claim 50: An input system as in Claim 49 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the physical device comprises a remotely operated machine (Kramer: column 12, lines 19-21).

Claim 51: An input system as in Claim 49 (Maguire: column 2, lines 15-50; Marci: column 2, lines 8-19 with columns 7-8, lines 56-67 and 1-8, respectively; Maguire: column 2, lines 29-39; Watanabe: column 14, lines 8-11) wherein the computer controls

the vibration devices to provide feedback to the user which is based upon the motion of the physical device (Kramer: column 8, lines 45-59 with Watanabe: abstract).

Correspondence Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mr. Tom Stevens whose telephone number is (703) 305-0365, Monday-Friday (8:00 am- 4:30 pm) or contact Supervisor Mr. Kevin Teska at (703) 305-9704. The fax number for the group is 703-872-9306.

Any inquires of general nature or relating to the status of this application should be directed to the Group receptionist whose phone number is (703) 305-3900.

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THS